



Requirements Working Group

- *Strategic Objective:*
 - Review the existing Navy requirements / capabilities development and approval process making recommendations to enhance requirements / capabilities understanding and facilitate optimum resource planning.



REQUIREMENTS WORKING GROUP

• ***TEAM MEMBERS***

- Mr. Ed Greer, NAVAIR AIR-5.0 Executive Director*
- Mr. Rich Gilpin, OPNAV N78B*
- CDR Bryan Herdlick, OPNAV N091*
- CDR Bill Gilligan, NAVAIR PMA-299*
- Ms. Lois Harper, PEO(C4I-SP)*
- Mr. John Hartford, PEO(C4I-SP)*
- Mr. Andy Kristovich, NAVSEA SEA-62T2202*
- Mr. Glen Myers, NAVSEA PMS-450*
- Mr. Todd Wilder, NUWC Keyport*
- Dr. Charles Hutchings, NAVSEA SEA-62T*
- CAPT Paul Grosklags, NAVAIR PEO(A)*
- CAPT Stevens Shegrud, OPNAV NC1*
- Mr. Randy Allen, NAVAIR (On Rotation to N78B)*



Requirements Working Group T&E Cost Drivers

- ☐ *Vague, Ill-Defined, or Un-Justified Requirements*
- ☐ *Un-testable or Impractical-to-test Requirements*
- ☐ *Poor Implementation New Policy Requirements*
- ☐ *Qualification and Development Test Requirements*
- ☐ *High Turnover of Requirements Writers and Testers and Loss of Lessons Learned*
- ☐ *Poor Integration or Understanding of System-Under-Test Con-Ops*
- ☐ *Lack of T&E Community (DT/OT) Buy-In and Understanding of Program Requirements*
- ☐ *Lack of Funding To Requirements*
- ☐ *Requirements Instability due to Long Review Process*

Team Discussion Areas



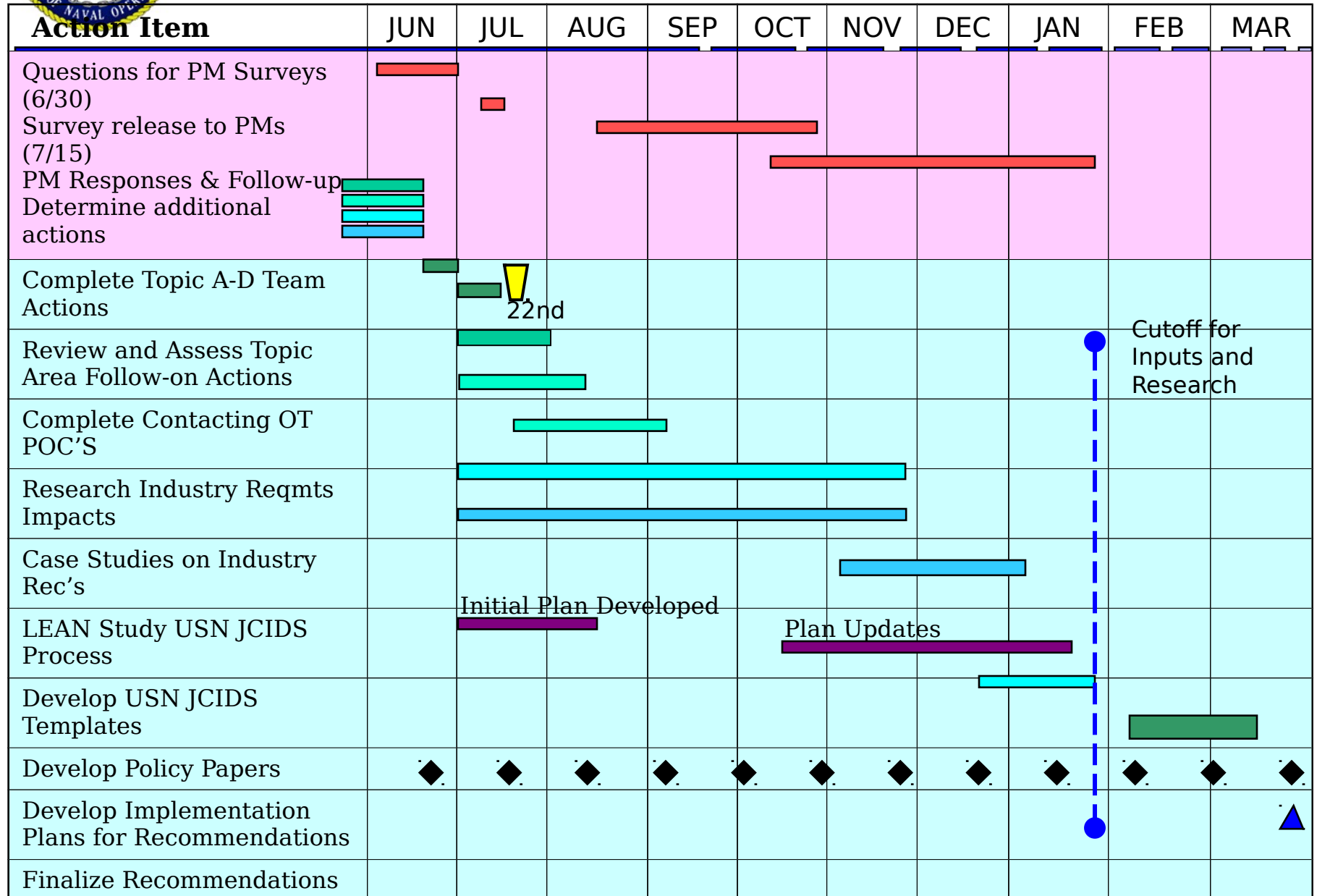


Requirements Working Group Topic Areas

- TOPIC A: Research USAF and USA T&E lessons learned and processes and how their requirements generation process helped them avoid T&E costs. Document lessons learned and processes which are shown to avoid T&E costs.
- TOPIC LEADER: [Dr. Charles Hutchings, supported by Lois Harper, John Hartford, Todd Wilder](#)
- TOPIC B: Survey the T&E community (VX's) to determine requirements lessons learned and best practices for dealing with requirements issues.
- TOPIC LEADER: [CDR Bill Gilligan, supported by Todd Wilder](#)
- TOPIC C: Assess how development and qualification costs imposed by MIL-specs and -standards affect T&E costs to programs and industry.
- TOPIC LEADER: [Mr. Rich Gilpin, supported by Randy Allen](#)
- TOPIC D: Assess how the Joint Capability Integration Development System (JCIDS) acquisition process can be improved to avoid vague or un-testable requirements, possibly by the development of guidance templates for testing.
- TOPIC LEADER: [Mr. Glen Myers, Supported by Lois Harper, John Hartford](#)



REQUIREMENTS WORKING GROUP ROADMAP





Requirements Working Group

Detailed Task Descriptions & Assessments

WORKING GROUP TASK	POTENTIAL COST IMPACT	TASK EASE of EXECUTION	RESPONSIBILITY
<ul style="list-style-type: none"> Identify problems (eg. vague requirements, un-testable requirements) with JCIDS process and/or JCIDS process implementation and make recommendations for problem corrections. Identify associated T&E cost drivers inherent to JCIDS process. (Glenn) Evaluate the advantages of the use of state-of-the-art procedures to define & mandate the specification of requirements for a relatively complex defense software-intensive system. (Charles) 	<ul style="list-style-type: none"> HIGH 	<ul style="list-style-type: none"> MODERATE 	<ul style="list-style-type: none"> REQMTS
<ul style="list-style-type: none"> Non-DT/OT Test Requirements Cost Drivers (eg. Structural or material certifications, product certification, software certification, etc.) Eliminate Structural Testing requirements that levy excessive test cycles/instrumentation to prove inherent robustness. (Bill) Eliminate need to retest an entire system (such as Communications) when prior JITC Certification was already achieved. Decide if USN accepts FAA/Commercial or Other Services Standards. (Bill) 	<ul style="list-style-type: none"> HIGH MODERATE MODERATE 	<ul style="list-style-type: none"> MODERATE MODERATE HIGH 	<ul style="list-style-type: none"> ASN (SYSTEM ENGINEERING) JROC CNO
<ul style="list-style-type: none"> Eliminate "One Size Fits All" Engineering Policy to eliminate SPR's, SDR's, PDR's and CDR's for every Weapon System. (Bill) Set realistic, testable KPP's with a streamlined revision process if changes become necessary. (Bill) 	<ul style="list-style-type: none"> MODERATE HIGH 	<ul style="list-style-type: none"> MODERATE MODERATE 	<ul style="list-style-type: none"> ASN (SYSTEM ENGINEERING) RQMT'S OFFICER



Requirements Working Group Tactical Objectives to Date (pg 2)



WORKING GROUP TASK	POTENTIAL COST IMPACT	TASK EASE of EXECUTION	RESPONSIBILITY
<ul style="list-style-type: none"> Develop overarching process for minimizing impact of multiple requirements documents imposing too many KPPs on single program. (Glen) Review process for vetting KPPs. (Glen) Develop Template to eliminate process errors. Investigate Requirements Process in-efficiencies and develop appropriate Policy or Requirements Changes to LEAN process. (Glenn/RTA) 	• MODERATE	• HIGH	• REQMTS WG / POLICY WG
<ul style="list-style-type: none"> Evaluate the archiving and use of all Navy-approved reliability, availability, and maintainability data, including vendor-generated data, from technical, developmental, and operational tests, and field performance data to provide a continuing assessment of weapons reliability, availability, and maintainability characteristics to refine weapon systems suitability requirements development, testing, and modeling. (Charles) 	• MODERATE	• HIGH	• REQMTS WG
<ul style="list-style-type: none"> Examine the advantages and disadvantages of the use of methods for obligating developers under contract to DoD to use state-of-the-art methods for requirements analysis and software testing, in particular, and software engineering and development more generally. (Charles) 	• MODERATE	• MODERATE	• REQMTS WG
<ul style="list-style-type: none"> Study the use of combat simulations, including 	• MODERATE	• MODERATE	• REQMTS WG



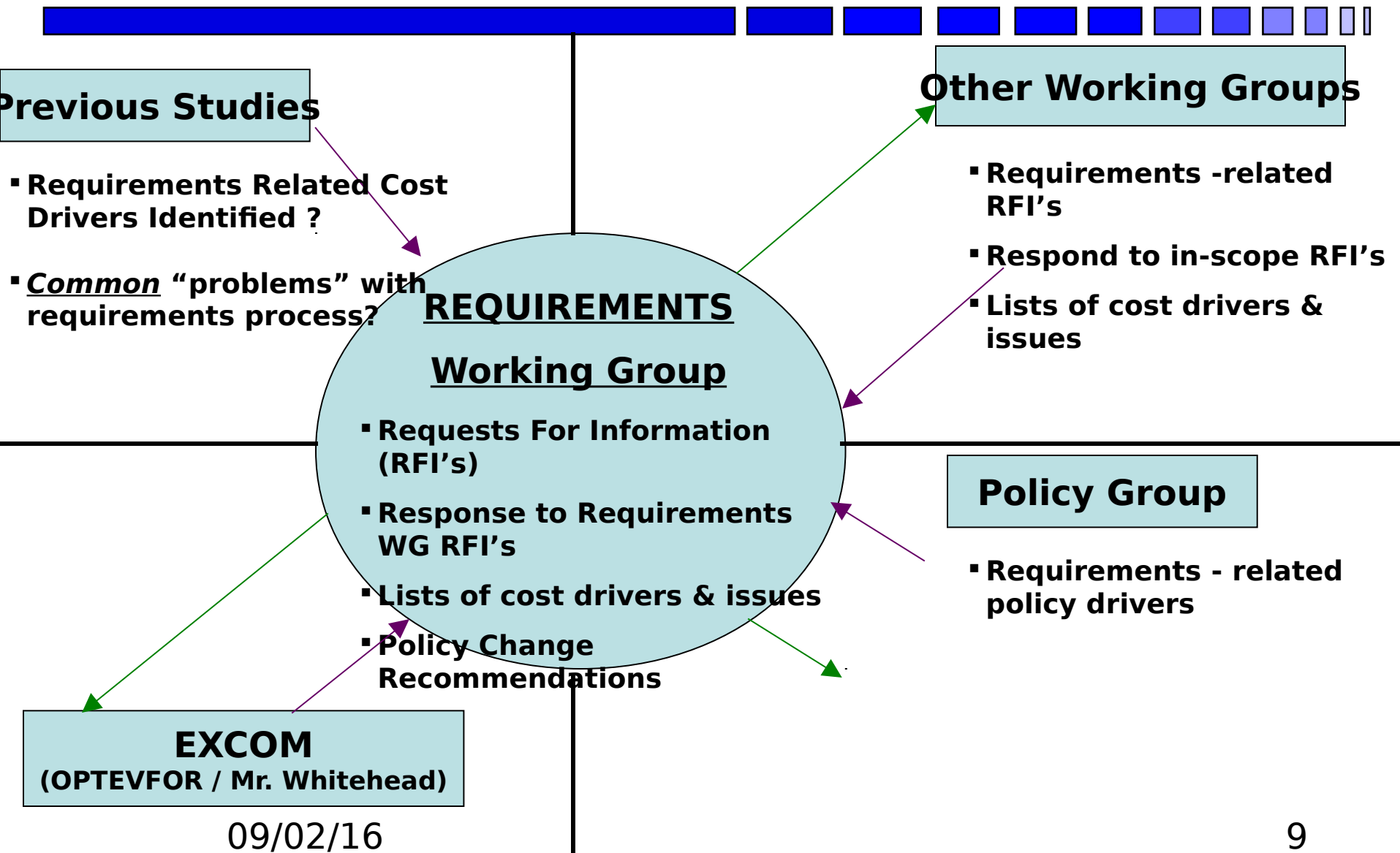
Requirements Working Group Tactical Objectives to Date (pg 2)



WORKING GROUP TASK	POTENTIAL COST IMPACT	TASK EASE of EXECUTION	RESPONSIBILI TY
<ul style="list-style-type: none">• Examine the advantages and disadvantages of the use of methods for obligating software developers under contract to DoD to use M&S throughout system development to support T&E planning and analysis. (Charles)	<ul style="list-style-type: none">• MODERATE	<ul style="list-style-type: none">• HIGH	<ul style="list-style-type: none">• REQMTS WG



Requirements Working Group Team Interrelationships





Requirements Working Group Expected Outputs

– Expectations at Completion of March 05

- Report to CNO which includes status of efforts completed, recommendations for cost reductions by March 05 and recommendations for future efforts (including required resources) beyond Mar 05.
- Development of a JCIDS Process Templates for use by Resource Sponsors, Programs, and Testers
- Policy change recommendations re: Requirements Process drivers (those which affect testers, contractors, programs)



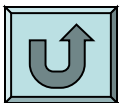
Backups





Requirements Working Group Working Group Discussion Areas

- ❑ Introduction of new or vague requirements, untestable requirements, high level mandates and laws (eg. Live Fire Test Requirements, Interoperability) all drive cost into T&E programs.
- ❑ Several lessons learned source data from various studies and assessments of T&E are available and need to be captured by the team, including studies by the USAF, N76/N78, SPAWAR, NAVAIR, NAVSEA.
- ❑ Writers of TEMPS and ORDS frequently have had no prior experience with T&E best practices and lessons learned. Writers of those documents usually work with whatever was written last time, without regard to impacts to cost of T&E and end up with vague or un-testable T&E requirements in program documents. The review process may not be robust enough to capture best practices due to high turn-over of personnel at all levels.
- ❑ Cannot ignore development and qualification T&E costs. May be significant cost drivers. Reasonableness of testing vs. risk
- ❑ How does doctrine & tactics derive into T&E requirements? What are good/bad applications of concept of operations in T&E process?
- ❑ Threat assessments can drive T&E costs if the threat is not easily available for testing.
- ❑ Templates of test criteria could be developed for RO's and Testers that help minimize costs for various acquisition products: (e.g.. sensors, weapons, aircraft, etc.)
- ❑ NAVSEA uses an OOC (Observation of Operational Capability) process for some rapidly changing technologies. What are shortfalls/benefits and are these processes applicable across the Navy?





REQUIREMENTS WG POA&M

Thru July

	MAY	JUNE	JULY
TOPIC A (USAF / USA PROCESSES) CONTACT AFOTEC/ATEC & ID USAF/USA REQUIREMENTS LESSONS LEARNED	5/20 	6/10	
TOPIC B (T&E REQMTS BEST PRACTICES) CONTACT DT & OT ORGANIZATIONS (eg. VX-9, HMX-1, etc)	5/21 	6/18 5/21 	
TOPIC C (INDUSTRY T&E COSTS) AUDIT SINGLE PROCESS INITIATIVE (SPI) PROGRAM COST SAVINGS TO GOVT CONTACT INDUSTRY LEADS TO DETERMINE GOVT T&E COST DRIVERS	5/21 	6/18	
TOPIC D (REVIEW JCIDS PROCESS)		6/14 	7/2
COMPILE & ASSESS LESSONS LEARNED, PROCESSES, COMMENTS			7/5 7/22
IDENTIFY AND SUBMIT RECOMMENDATIONS			

09/02/16



Too Many KPPs

- **Description:** CJCSIM states that "The CDD and the CPD contain only those few KPPs (generally eight or fewer) . . ." No consideration is given to the effect of roll-up of multiple CRDs on program documentation.
- **Example:** Potentially the GIG CRD imposes 10 KPPs - one of which has 24 critical items; GCCS imposes 3 KPPs; IDM CRD imposes 5 KPPs; the Combat ID CRD imposes 5 KPPs. The total non-program originated KPPs is TBD (23???). If there are 8 KPPs considered necessary for a program, there would then be a total of 31 KPPs assigned to that program; the program in effect is overwhelmed by non-program imposed KPPs.
- **Program Impact:** Excessive expenditure of time, manpower, and funds is required to implement and test the number of KPPs imposed. The excess KPPs impact viability of some programs.
- **Recommended Actions:** Adhere to the requirements of CJCSI 3170.01 and limit KPPs to fewer than 8 (**TOTAL**) for each program.



Should it be a KPP?

- **Description:** CJCSIM states that "Failure to meet a . . . KPP threshold may result in a reevaluation, reassessment or termination of the program . . ."
- **Example:** GIG CRD crosswalk imposed 150 items on the program in the crosswalk matrix. The requirements required extensive analysis to evaluate compliance and impact to specifications and designs.
- **Program Impact:** Hundreds of man hours were spent to determine which of the crosswalk items were appropriate for the ORD, which could be added to the ORD and which were best left in the system specifications and Functional Requirements Documents (FRD). Directed to include CRD crosswalk in capabilities documents which is inconsistent with policy to minimize operational requirements
- **Recommended Actions:** Allow sponsor to determine whether the requirements should be addressed in the applicable capabilities documents or lower level system specifications or FRDs.



Inappropriate Requirements

- **Description:** CJCSIM states that "The CDD and the CPD contain only those few KPPs (generally eight or fewer) . . ."
- Level of requirements not always appropriate for the program requirements. Many new requirements could be more appropriately assigned to lower level documents (e.g., specifications).
- **Example:** GIG CRD crosswalk imposed 150 items on the program in the crosswalk matrix. The requirements required extensive analysis to evaluate compliance and impact to specifications and designs.
- **Program Impact:** Hundreds of man hours were spent to determine which of the crosswalk items were appropriate for the ORD, which could be added to the ORD and which were best left in the system specifications and Functional Requirements Documents (FRD). Directed to include CRD crosswalk in capabilities documents which is inconsistent with policy to minimize operational requirements
- **Recommended Actions:** Allow sponsor to determine whether the requirements should be addressed in the applicable capabilities documents or lower level system specifications or FRDs.



Un-Testable Requirements

- **Description:** Threshold and objective values are too stringent to demonstrate attainment without an unreasonable amount of testing.
- **Example:** GIG KPP thresholds:
 - Quality of Service: Threshold 99%, Objective 99.9%
 - Information Integrity: Threshold 99.99%, Objective 99.999%
 - Transport Element Status: Threshold 99%, Objective 99.9%
 - Secure Voice Interoperability: Threshold 99%, Objective 99.9%
 - Network Status: Threshold 99%, Objective 99.9%
- **Program Impact:** A single failure in testing can result in missing threshold values and require additional testing and/or analysis. Also, statistically valid data sets will require extensive testing.
- **Recommended Actions:** Re-examine imposed threshold values to ensure they are reasonable. Recommend fleet input in determining acceptable performance thresholds. Evaluate ability to change threshold criteria. Determine if incremental thresholds are appropriate in line with Evolutionary Acquisition



Inappropriate Requirements

- **Description:** Many Key Performance Parameters imposed by CRDs are not appropriate as KPPs for the program requirements.
- **Example:** The MSII VIRGINIA Class ORD contained 15 KPPs that were high level platform requirements considered significant to the warfighting capability of the system. The GIG CRD imposed an additional 11 KPPs related specifically to interoperability.
- **Program Impact:** IAW CJCSM 3170.10A, KPPs are requirements, that if not met, the sponsor should consider canceling or significantly restructuring the program. In addition, it states that capability documents should contain only those few KPPs (generally eight or fewer) that capture the minimum operational attributes for the system. Programs could be put in jeopardy for failing requirements which are not KPPs as defined by JCIDS.
- **Recommended Actions:** Re-evaluate the KPPs imposed by CRDs to minimize those imposed on programs and ensure they meet the guidance contained in CJCSM 3170.01A.



Conflicting/Unrealistic/Vague Requirements

- **Description:** Basis or concept of operations for new requirements are not always clear and may conflict with other directives.
- **Examples:**
 - Conflicting Network Management and Information Assurance requirements imposed by the GIG CRD and NSA direction on system design.
 - Requirements do not take into account operating conditions (submerged operations) and specific mission requirements (e.g., submarine emission control (EMCON) limits during deployments).
- **Program Impact:**
 - Requires investment of engineering resources to de-conflict directives
 - Requires justification to requirements generators as to why the program can not comply.
- **Recommended Actions:**
 - Ensure the requirements generation community adequately engages end users, program sponsors and other agencies that levy requirements on the program office.



Unfunded Requirements

- **Description:** Requirements are levied on program without consideration for cost or allowance for time to budget for requirement. There is no provision to POM out.
- **Example:** VIRGINIA Class Program reached MSII along with C3I contract award in 1995. Several Joint Interoperability CRDs were levied on the program (e.g., GIG CRD in Aug 2001) well beyond when the design was complete.
- **Program Impact:** Extensive effort to address program impact and prioritize new capabilities that must be met versus those that can be delayed until the overarching systems (e.g., GIG ES) are defined to allow development of the new capability. Expense incurred and requirement unable to be met because of contract and budget impacts.
- **Recommended Actions:** Communication of intentions to impose requirements through JCIDS must be improved along with earlier involvement of the acquisition community.

Unfunded requirements will never be met



Unfunded Requirements

- **Description:** Requirements are levied without allowing for evaluation of cost as an independent variable (CAIV). Analysis of Alternatives (AOAs) are not completed prior to imposing new requirements on the program.
- **Example:** GIG CRD levied on the program without completion of the GIG ES AOA or any equivalent effort for the systems that must support the GIG.
- **Program Impact:** There is no opportunity for a top down evaluation of the optimum approach for the VA Class program to meet the GIG requirements
- **Recommended Actions:** Communication of intentions to impose requirements through JCIDS must be improved along with earlier involvement of the acquisition community.



Inappropriate Phasing

- **Description:** JCIDS process imposes requirements on programs before the underlying infrastructure has been designed/developed.
- **Example:** The GIG CRD requirements imposed on programs before the infrastructure is in place to support implementation (GIG ES and GIG Bandwidth expansion). As of Mar 2004 DISA was still trying to establish cost estimates for the GIG NCES AOA, even though the GIG CRD was issued in Aug 2001.
- **Program Impact:** Additional cost incurred to bring system in the development and production phase into compliance with new systems.
- **Recommended Actions:** Ensure underlying infrastructure is defined to a level needed to support GIG family of systems development.



Requirements Management Inefficiencies

- **Description:** Proliferation of multiple requirements documents and conflicting or overlapping guidance between these documents.
- **Example:** There have been 4 revisions CJCSI 3170 series document, 2 Revisions of CJCSI 6212 Interoperability and Supportability of National Security Systems and IT Systems, 5 versions of the JTA and imposition of 5 Interoperability Capstone Requirements Documents. CJCSI 3170.01D states integrated architectures are not covered and more changes are on the way.
- **Program Impact:** As a result of all of these requirements changes ORD Rev A has not been approved since effort was initiated on 16 Nov 99.
- **Recommended Actions:** Need better coordination of requirements generation process and promulgation of future requirements documentation changes.



Requirements Management Inefficiencies (Cont'd)

- **Description:** Process is long, not properly controlled and changing rapidly. In addition to the ever changing set of requirements documents, the review and comment process is long and laborious. Superseded documents have been cited for continued use.
- **Example:** The JCIDS review process includes multiple Service and Joint O-6 and Flag level reviews. These reviews are subject to extremely wide distribution resulting in a broad array of comments. The VIRGINIA Class ORD Rev A received extraordinary number of review comments that were outside the scope of the original update (Interoperability and Cost).
- **Program Impact:** Critical and often constrained Program Office resources are diverted to manage the ever changing requirements landscape
- **Recommended Actions:** Streamline the JCIDS process to eliminate churn to programs. Require the JCIDS review process to be strictly focused. Limit reviews to changes and to appropriate stakeholders.



Requirements Management Inefficiencies (Cont'd)

- **Description:** Spiral Development/Evolutionary Acquisition leads to multiple, often overlapping, T&E cycles. Acquisition community needs to understand that T&E will cost more because of the incremental testing requirements needed to support this acquisition approach.
- **Example:** Fleet expectations for deploying advanced capability systems is driving the SD/EA process too rapidly. Testing of immature systems is required to support the acquisition process approach, often resulting in failing OT and requiring retests.
- **Program Impact:** Forced to test immature systems for fleet deployments leading to unnecessary retesting or redundant testing. System suitability (especially reliability) is often a major deficiency in OPEVAL reports.
- **Recommended Actions:** Develop realistic plans for integrating new technologies and capabilities.



Lack of Coordination

- **Description:** Services are developing their solutions/answers.
- **Example:** Different DoD components are implementing different joint interoperability solutions (FORCNET, C2 Constellation, LANDWARNET)
- **Program Impact:** Additional effort may be required in redirecting system designs when interoperability problems are encounter.
- **Recommended Actions:** Ensure Services are developing solutions that are fully interoperable with the GIG.



TEMPLATE Development

- Un-Testable Requirements
 - Have parameters been selected that reflect spiral development?
 - Do thresholds support the operators needs and require a reasonable amount of testing to demonstrate?
- Inappropriate Requirements
 - Have KPPs been limited to those considered significant to the warfighting capability of the system?
 - Have crosswalk requirements been adjudicated for inclusion in either the capabilities documents or lower level FRD/Specifications as needed?
- Unfunded Requirements
 - Have the AOA and CAIV efforts been completed?
 - Has the sponsor and developer been provided the opportunity to assess cost impact and develop POM inputs?



TEMPLATE Development

- Conflicting/Unrealistic/Vague Requirements
 - Do the requirements being levied on the program reflect the operational limitations of the program?
 - Are the new requirements consistent with other ongoing requirements?
- Inappropriate Phasing
 - Are the overarching systems sufficiently defined to allow development of this new capability?
- Requirements Management
 - Have pending requirements changes been reviewed for applicability to this acquisition program?
 - Has the review of the capability document been limited to fit the scope of the new document or update?